

## WHAT IS CLAIMED IS:

## 1. A game controller comprising:

5 a moveable element having an optically readable pattern on a surface thereof, said moveable element moving relative to a fixed position and having a position characterized by a relative position of said moveable element relative to said fixed position;

10 an imaging element that forms an image of a sub-area on said surface, said sub-area being determined by said relative position of said moveable element relative to said fixed position;

a memory for storing a map that specifies said readable pattern in each sub-area on said surface that can be imaged by said imaging element; and

15

a controller for comparing said image to said map to determine said position of said moveable element.

20 2. The game controller of Claim 1 wherein said pattern comprises a plurality of randomly distributed spots.

25 3. The game controller of Claim 1 wherein said controller generates a signal indicative of a position of said spherical element in terms of first and second orthogonal displacements from a reference position.

25

4. The game controller of Claim 1 wherein said controller generates a signal indicative of a rotation of said moveable element about a predetermined axis on said moveable element.

30 5. The game controller of Claim 4 wherein said moveable element comprises a handle.

6. The game controller of Claim 5 wherein said handle comprises a shaft with a shaft axis parallel to said predetermined axis.

5 7. The game controller of Claim 5 wherein said handle further comprises a push button having a state that is sensed by said controller.

8. The game controller of Claim 1 wherein said map comprises a plurality of sub-maps that are rotated relative to one another.

10 9. The game controller of Claim 1 wherein said controller comprises a plurality of search processors, each search processor comparing a portion of said map with said image formed by said imaging element.